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PSMSL and GPS data for European stations: Some conclusions

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Satellite altimetry doesn't seem an adequate approach for evaluating sea level changes in coastal areas. The tide gauge trends available at Permanent Service for Mean Sea Level (PSMSL) only give relative sea level information. The calculated trends are strongly affected by the length of the series. On the other side, possible land movements taking place at tide gauge location must be evaluated. Fig. 1A was constructed from the GPS trends for European stations available at SONEL site. There is a clear influence of postglacial isostatic rebound in Scandinavia and northern England. To the south, almost all the stations have negative GPS signals. These subsiding processes will accentuate post-Little Ice Age (LIA) sea level rise. There are some exceptions in southern Europe, where neotectonic movements may produce a localized uplift and GPS trends are quite different on nearby stations (southern Spain: Huelva, Tarifa, Ceuta, fig. 1A). The real "eustatic" component must be understood as the difference between relative sea level changes (tide gauge data) and vertical GPS velocities. The results obtained by this process for all European stations produces an average of 0,996 mm/year. This seems quite plausible and it is similar to the values calculated by Mörner. At SONEL site there are maps showing the combined result of PSMSL with the GPS data for some selected stations. Fig. 1B shows the results for Iberia. For the elaboration of these maps, the ideal situation should be a tide gauge coupled with a GPS station exactly at the same place, or within a very small distance [4]. However, sometimes, the GPS data are obtained from points at a significant distance from the tide gauge stations (10,75km for Huelva, 10,28km for Cadiz). So, the maps of SONEL site must be used with care and some criticism.

Biography

Maria da Assuncao Araujo is working as a Professor in the Geography Department, Porto University, Portugal. Her main interests are in Geomorphology, Quaternary studies, Neotectonics, littoral Geomorphology and Geomorphologic heritage. She completed her PhD from Porto University, 1991 and her thesis is about the geomorphologic evolution of littoral platform at Porto region. Her research on Quaternary marine deposits has evolved into a more recent interest in sea level changes and the interference of neotectonics in coastal development. She has published numerous papers on sea level changes, coastal platforms, and the geomorphology of the Iberian Peninsula. She also presented papers at several international conferences.

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